IN THE CLAIMS

Please amend the claims as follows.

1. – 37. (Canceled)

38. (Currently Amended) A method of constructing a three-dimensional world for a computer game using a set of predetermined three-dimensional tiles and a map specifying relative positions for the tiles, each tile comprising tile data including tile internal visual geometry data for defining visual geometry of the 3D world and invisible game control data; map data comprising tile identification data and tile position data identifying tiles from the set and their positions; world data comprising world visual geometry data and world game control data for the computer game, in a three-dimensional world space; the method comprising:

reading the map data;

transforming the internal visual geometry data into said world space, using the map data

joining said transformed internal visual geometry of said identified tiles to generate said world visual geometry data defining substantially contiguous internal 3D surface enclosing said 3D world;

transforming the invisible game control data into the world space, using the map data; and

combining said transformed invisible game control data of said identified tiles to generate said world game control data.

39. (Original) A method as claimed in claim 38, wherein the invisible game control data comprises data selected from a group including collision geometry data, non-player character navigational data and viewing portal data.

40. (Original) A method as claimed in claim 39 when the game control data includes navigational data, further comprising linking navigational data from different tiles after

transforming the navigational data into said world space to facilitate non-player character navigation in the world space.

41. (Original) A method as claimed in claim 39 when the game control data includes portal data, further comprising matching portal data from different tiles, after transforming the portal data into said world space, to remove duplicate portals.

42. (Original) A method as claimed in claim 38, wherein each tile has at least one interface portion for joining the tile to another tile and wherein said tile visual geometry data defines matching visual geometry for the interface portions of at least a subset of the tiles such that when tile visual geometry data for tiles of the subset is transformed into said world space the resulting world visual geometry data defines substantially contiguous visual world geometry across interfaces between the tiles.

43. (Original) A method as claimed in claim 38, wherein the tile data includes plug visual geometry data whereby the tile data provides data defining at least two versions of visual geometry for each tile, a first version in which an interface to the tile is closed by a visual plug defined by the plug visual geometry data and a second version in which an interface to the tile is open for joining the tile to another tile.

44. (Original) A method as claimed in claim 38, the method further comprising:

providing a user interface for constructing said map, the user interface representing the three-dimensional world as a series of two dimensional levels on which the three-dimensional tiles may be placed; and

receiving data for generating said map data from said user interface.

45. (Original) A method as claimed in claim 44, wherein said tile data includes data for one or more tiles spanning at least two of the two dimensional levels, whereby two of the two dimensional levels are linkable.

46. (Original) A method as claimed in claim 44, wherein said user interface includes an indicator for providing the user with an indication of the memory requirements of the world data for a three-dimensional world constructed using the map.

47. (Original) A method as claimed in claim 38, the method further comprising:

inputting data for selecting tile data for the said set of predetermined 3D tiles from tile data for a plurality of sets of 3D tiles, each tile within a set having tile data defining interface features for interfacing to the other tiles, the interface features of each tile substantially corresponding to interface features of at least one tile in each other set of 3D tiles.

48. (Currently Amended) Data processing apparatus for constructing a three-dimensional world for a computer game using a set of predetermined three-dimensional tiles and a map specifying relative positions for the tiles, each tile comprising tile data including tile internal visual geometry data for defining visual geometry of the 3D world and invisible game control data; map data comprising tile identification data and tile position data identifying tiles from the set and their positions; world data comprising world visual geometry data and world game control data for the computer game, in a three-dimensional world space; the apparatus comprising:

a data memory operable to store said map data, and storing said tile data:

an instruction memory storing processor implementable instructions; and

a processor operable to read and process data from the data memory in accordance with instructions stored in the instruction memory;

wherein the stored instructions comprise instructions for controlling the processor to:

read the map data;

transform the internal visual geometry data into said world space, using the map data;

join said transformed internal visual geometry of said identified tiles to generate said world visual geometry data <u>defining a substantially contiguous internal 3D surface enclosing said 3D world</u>;

transform the invisible game control data into the world space, using the map data; and

combine said transformed invisible game control data of said identified tiles to generate said world game control data.

49. (Original) A data processing apparatus as claimed in claim 48, wherein the tile data includes plug visual geometry data whereby the tile data provides data defining at least two versions of visual geometry for each tile, a first version in which an interface to the tile is closed by a visual plug defined by the plug visual geometry data and a second version in which an interface to the tile is open for joining the tile to another tile.

50. (Original) A data processing apparatus as claimed in claim 48, wherein the stored instructions further comprise instructions for controlling the processor to input data for selecting tile data for the said set of predetermined 3D tiles from tile data for a plurality of sets of 3D tiles, each tile within a set having tile data defining interface features for interfacing to the other tiles, the interface features of each tile substantially corresponding to interface features of at least one tile in each other set of 3D tiles.

51. (Canceled)

52. (Currently Amended) A method as claimed in claim ~~51~~ 53, wherein said predetermined constructional elements comprise a plurality of sets of elements, each set having corresponding interfaces, the method further comprising:

inputting set selection data for selecting a said set of elements; and

storing said set selection data on the storage medium in association with said structure data;

whereby data is provided specifying the construction of one of a set of said virtual 3D environments from the selected set of constructional elements.

53. (Currently Amended) A method ~~as claimed in claim 51, further comprising:~~ of providing data for constructing a virtual 3D environment using predetermined 3D constructional elements, the elements having visible geometry internal to the elements for defining portions of said virtual 3D environment and internal geometry interfaces for connecting one element to another; the method comprising:

representing said 3D constructional elements to a user;

inputting instructions from the user for assembling the elements into a structure in which the elements are connected at the internal geometry interfaces, the structure representing the virtual 3D environment;

representing the structure to the user;

storing structure data representing the structure on a storage medium for constructing the virtual 3D environment; and

displaying an approximate memory requirement of the virtual 3D environment represented by the structure.

54. (Original) A method as claimed in claim 53, wherein said displaying displays an approximate difference between an estimated memory requirement of the 3D virtual environment and a maximum available memory space.

55. (Currently Amended) A method as claimed in claim ~~51~~ 53, further comprising:

inputting item placement instructions from the user; and

storing item placement data corresponding to said item placement instructions on said storage medium in association with said structure data.

56. (Currently Amended) A method ~~as claimed in claim 51, further comprising:~~ of providing data for constructing a virtual 3D environment using predetermined 3D constructional elements, the elements having visible geometry internal to the elements for defining portions of said virtual 3D environment and internal geometry interfaces for connecting one element to another; the method comprising:

representing said 3D constructional elements to a user;

inputting instructions from the user for assembling the elements into a structure in which the elements are connected at the internal geometry interfaces, the structure representing the virtual 3D environment;

representing the structure to the user;

storing structure data representing the structure on a storage medium for constructing the virtual 3D environment;

inputting lighting instructions from the user; and

storing lighting data corresponding to said lighting instructions on said storage medium in association with said structure data.

57. (Original) A method as claimed in claim 56, wherein said lighting instructions include lighting phase instructions for setting a phase of a lighting intensity variation; and wherein said lighting data includes lighting phase data corresponding to said lighting phase instructions.

58. (Currently Amended) A method as claimed in claim ~~51~~ 56, wherein said structure data includes constructional element identification data and constructional element position data for a plurality of elements, specifying positions of said predetermined constructional elements in the structure.

59. (Original) A method as claimed in claim 58, wherein said structure further includes connection data specifying connections between constructional elements in the structure.

60. (Currently Amended) A method as claimed in claim ~~51~~ 56, wherein said representing comprises representing said structure to the user as substantially 2D elements located on a grid, said 2D elements representing said 3D constructional elements.

61. (Currently Amended) Data processing apparatus for providing data for constructing a virtual 3D environment using predetermined 3D constructional elements, the elements having

visible geometry internal to the elements for defining portions of said virtual 3D environment and internal geometry interfaces for connecting one element to another, the apparatus comprising:

a data memory operable to store structure data representing the structure for constructing the virtual 3D environment, and storing data for representing said 3D constructional elements to a user;

an instruction memory storing processor implementable instructions; and

a processor operable to read and process data from the data memory in accordance with instructions stored in the instruction memory;

wherein the stored instructions comprise instructions for controlling the processor to:

represent said 3D constructional elements to a user;

input instructions from the user for assembling the elements into a structure in which the elements are connected at the internal geometry interfaces, the structure representing the virtual 3D environment;

represent the structure to the user; ~~and~~

store said structure data on a computer readable carrier; and

display an approximate memory requirement of the virtual 3D environment represented by the structure.

62. (Currently Amended) A computer readable medium carrying computer readable instructions for controlling a computer system to perform the method of any one of claims ~~1 to 15, 23 to 34,~~ 38 to 47, 53-60 and 116-122 ~~51 to 60~~.

63. (Previously Presented) A user interface for constructing a representation of a three-dimensional virtual environment using predetermined constructional elements, each element defining a 3D internal geometry for use in defining a region within the 3D virtual environment, the user interface comprising:

a selection component for the user to select a said predetermined constructional element;

a placing component for the user to place the selected element in relation to other placed elements; and

a joining component to join the internal geometry of the placed elements to provide a representation of the 3D virtual environment.

64. (Original) A user interface as claimed in claim 63, further comprising a display component to display the representation of the 3D virtual environment.

65. (Original) A user interface as claimed in claim 64, wherein the display component comprises a 2D display component to display a 2D representation of the 3D virtual environment.

66. (Original) A user interface as claimed in claim 65, wherein the 2D representation comprises a plurality of 2D grids representing sections through the 3D virtual environment, and wherein the display component includes a selection component for the user to select a said section.

67. (Original) A user interface as claimed in claim 66, wherein said sections represent substantially horizontal levels within the 3D virtual environment and wherein at least one said predetermined constructional element spans two or more levels, whereby the horizontal levels are linkable.

68. (Original) A user interface as claimed in claim 64, wherein the display component comprises a 3D display component to display a 3D representation of the 3D virtual environment.

69. (Previously Presented) A user interface as claimed in claim 63, wherein each element defines a closed internal 3D space and wherein the joining component opens interfaces between joined elements.

70. (Original) A user interface as claimed in claim 63, wherein associated with each said constructional element is a plurality of 3D tiles, each tile belonging to a respective tileset, the

tiles within each tileset having a common visual stylistic appearance, the user interface further comprising a tileset selection component for the user to select a tileset for use with said constructional elements for constructing a 3D representation of said 3D virtual environment.

71. (Original) A user interface as claimed in claim 63, further comprising a memory indicator component to provide an indication of a computer memory requirement of the 3D virtual environment.

72. (Original) A user interface as claimed in claim 63, wherein the placed and joined elements comprise a map of the 3D virtual environment, and wherein the user interface further comprises a map save component to save map data representing the map on a storage device, the map data comprising element identification data and position data.

73. (Previously Presented) Data processing apparatus for providing a user interface for constructing a representation of a three-dimensional virtual environment using predetermined constructional elements, each element defining a 3D internal geometry for use in defining a region within the 3D virtual environment, the apparatus comprising:

a data memory storing data representing said predetermined constructional elements;

an instruction memory storing processor implementable instructions; and

a processor operable to read and process data from the data memory in accordance with instructions stored in the instruction memory;

wherein the stored instructions comprise instructions for controlling the processor to provide for said user interface:

a selection component for the user to select a said predetermined constructional element;

a placing component for the user to place the selected element in relation to other placed elements; and

a joining component to join the internal geometry of the placed elements to provide a representation of the 3D virtual environment.

74. (Original) A data processing apparatus as claimed in claim 73, and wherein the stored instructions further comprise instructions for controlling the processor to provide for said user interface:

a display component to display the representation of the 3D virtual environment, the display component comprising a 3D display component to display a 3D representation of the 3D virtual environment.

75. (Original) A data processing apparatus as claimed in claim 73, and wherein the stored instructions further comprise instructions for controlling the processor to provide for said user interface:

a memory indicator component to provide an indication of a computer memory requirement of the 3D virtual environment.

76. (Original) A computer readable medium carrying computer readable instructions for controlling a computer system to provide the user interface of any one of claims 63 to 72.

77. (Canceled)

78. (Currently Amended) A data structure as claimed in claim ~~77~~ 81, further comprising connection data for each element, for determining whether the at least one interface connects to another element.

79. (Currently Amended) A data structure as claimed in claim ~~77~~ 81, wherein said predetermined constructional elements comprise a plurality of sets of elements, each set having corresponding interfaces, the data structure further comprising set data specifying a said set of elements for use in constructing the virtual 3D environment.

80. (Currently Amended) A data structure as claimed in claim ~~77~~ 81, further comprising object placement data for use in determining the placement of objects within the virtual 3D environment.

81. (Currently Amended) A data structure ~~as claimed in claim 77, further comprising~~ on a carrier medium, the data structure comprising data for use in constructing a virtual 3D environment from predetermined constructional elements, each constructional element having geometry defining an internal three-dimensional space and having at least one internal geometry interface for connecting the element to another of said predetermined elements, the data structure defining an arrangement of said elements and comprising constructional element identification data, constructional element position data for each of a plurality of said elements, and lighting placement data for use in determining the placement of lighting within the virtual 3D environment.

82. (Original) A data structure as claimed in claim 81, wherein said lighting data includes lighting phase data for setting a phase of a light intensity variation in the virtual 3D environment.

83. (Currently Amended) A data structure ~~as claimed in claim 77,~~ on a carrier medium, the data structure comprising data for use in constructing a virtual 3D environment from predetermined constructional elements, each constructional element having geometry defining an internal three-dimensional space and having at least one internal geometry interface for connecting the element to another of said predetermined elements, the data structure defining an arrangement of said elements and comprising constructional element identification data and constructional element position data for each of a plurality of said elements, wherein said virtual 3D environment is a virtual environment for a computer game.

84. (Previously Presented) A data structure on a carrier medium, the data structure comprising data for a 3D constructional element for use in constructing a virtual 3D environment, the data comprising internal 3D geometry data defining a 3D surface internal to said constructional

element for use in defining a portion of a contiguous internal bounding surface of said virtual 3D environment, said 3D virtual environment comprising a closed environment being bounded by said bounding surface.

85. (Original) A data structure as claimed in claim 84, wherein said constructional element has at least one interface portion for interfacing to another said constructional element for constructing said virtual 3D environment, wherein the 3D surface defined by said geometry data has an edge at said interface portion, said edge defining an opening, and wherein said 3D geometry data further includes plug geometry data defining a plug to close said opening, for use when said interface portion does not interface to another said constructional element.

86. (Original) A data structure as claimed in claim 84, wherein said 3D geometry data defines a 3D surface visible in said virtual 3D environment.

87. (Original) A data structure as claimed in claim 84, comprising data for a plurality of said 3D constructional elements forming a set of said constructional elements, each element within the set having at least one interface portion for interfacing to another element within the set for constructing said virtual 3D environment, said geometry data for an element defining the geometry of said interface portion of the element, the geometry of at least one interface portion of each constructional element in the set matching the geometry of an interface portion of each of the other constructional elements in the set.

88. (Original) A plurality of data structures, each as claimed in claim 87, comprising data for a plurality of said sets of constructional elements, each element having a connectivity determining to which other elements the element may be interfaced, the connectivity of an element being determined by said geometry data, each constructional element in a said set having a counterpart in each of the other sets, the connectivity of each said element substantially corresponding to the connectivity of the counterparts of the element.

89. (Original) A plurality of data structures as claimed in claim 88, wherein the geometry data for the interface portions of the constructional elements of one set is configured to define geometry to substantially match geometry of the interface portions of the elements of another said set.

90. (Original) A plurality of data structures as claimed in claim 88, further comprising texture data for the constructional elements for providing a visual appearance for said 3D surface of the element, each constructional element in a said set having texture data for a themed visual appearance different to the themed visual appearance of another said set of elements.

91. (Original) A plurality of data structures as claimed in claim 88, wherein the 3D geometry defined by 3D geometry data of a constructional element in one said set differs from the 3D geometry of the counterpart to the element in another said set.

92. (Original) A data structure as claimed in claim 84, wherein the virtual 3D environment comprises an environment for a computer game and wherein said bounding surface encloses a space within which the game is played.

93. (Original) A data structure as claimed in claim 92, wherein the data for the 3D constructional element further comprises portal data defining one or more portals for use by computer game code in determining which parts of the virtual 3D environment to process for potential display.

94. (Original) A data structure as claimed in claim 93, wherein each said constructional element has an interface portion for interfacing the element to other said constructional elements, and wherein a said portal is associated with said interface portion.

95. (Original) A data structure as claimed in claim 92, wherein the data for the 3D constructional element further comprises navigation data for use by computer game code in

determining a route through a part of the virtual 3D environment constructed using the 3D constructional element.

96. (Original) A data structure as claimed in claim 92, wherein said 3D geometry data includes collision geometry data for use by computer game code in determining collisions with parts of said 3D virtual environment.

97. (Original) A data structure as claimed in claim 84, wherein said constructional element has at least one interface portion for interfacing to another said constructional element for constructing said virtual 3D environment, wherein the 3D surface defined by said geometry data has an edge at said interface portion, said edge defining an opening, and wherein said 3D geometry data further includes plug geometry data defining a plug to close said opening, for use when said interface portion does not interface to another said constructional element.

98. (Original) A data structure as claimed in claim 97, wherein said plug geometry data defines both a visual geometry and a collision geometry of said 3D constructional element.

99. – 115. (Canceled)

116. (New) A method as claimed in claim 53, wherein said structure data includes constructional element identification data and constructional element position data for a plurality of elements, specifying positions of said predetermined constructional elements in the structure.

117. (New) A method as claimed in claim 53, wherein said structure further includes connection data specifying connections between constructional elements in the structure.

118. (New) A method as claimed in claim 53, wherein said representing comprises representing said structure to the user as substantially 2D elements located on a grid, said 2D elements representing said 3D constructional elements.

119. (New) A method as claimed in claim 56, wherein said predetermined constructional elements comprise a plurality of sets of elements, each set having corresponding interfaces, the method further comprising:

inputting set selection data for selecting a said set of elements; and

storing said set selection data on the storage medium in association with said structure data;

whereby data is provided specifying the construction of one of a set of said virtual 3D environments from the selected set of constructional elements.

120. (New) A method as claimed in claim 56, wherein said displaying displays an approximate difference between an estimated memory requirement of the 3D virtual environment and a maximum available memory space.

121. (New) A method as claimed in claim 56, further comprising:

inputting item placement instructions from the user; and

storing item placement data corresponding to said item placement instructions on said storage medium in association with said structure data.

122. (New) Data processing apparatus for providing data for constructing a virtual 3D environment using predetermined 3D constructional elements, the elements having visible geometry internal to the elements for defining portions of said virtual 3D environment and internal geometry interfaces for connecting one element to another, the apparatus comprising:

a data memory operable to store structure data representing the structure for constructing the virtual 3D environment, and storing data for representing said 3D constructional elements to a user;

an instruction memory storing processor implementable instructions; and

a processor operable to read and process data from the data memory in accordance with instructions stored in the instruction memory;

wherein the stored instructions comprise instructions for controlling the processor to:

represent said 3D constructional elements to a user;

input instructions from the user for assembling the elements into a structure in which the elements are connected at the internal geometry interfaces, the structure representing the virtual 3D environment;

inputting lighting instructions from the user;

storing lighting data corresponding to said lighting instructions on said storage medium in association with said structure data;

represent the structure to the user; and

store said structure data on a computer readable carrier.

123. (New) The apparatus of claim 122, wherein said structure data includes constructional element identification data and constructional element position data for a plurality of elements, specifying positions of said predetermined constructional elements in the structure.

124. (New) The apparatus of claim 122, wherein said structure further includes connection data specifying connections between constructional elements in the structure.

125. (New) The apparatus of claim 122, wherein said represent comprises representing said structure to the user as substantially 2D elements located on a grid, said 2D elements representing said 3D constructional elements.

126. (New) The apparatus of claim 122, wherein said constructional elements comprise a plurality of sets of elements, each set having corresponding interfaces, the instructions further comprising:

input set selection data for selecting a set of said elements; and

store said set selection data on the storage medium in association with said structure data;

whereby data is provided specifying the construction of one of a set of said virtual 3D environments from the selected set of constructional elements.

127. (New) The apparatus of claim 122, wherein said represent includes displaying an approximate difference between an estimated memory requirement of the 3D virtual environment and a maximum available memory space.

128. (New) The apparatus of claim 61, wherein said structure data includes constructional element identification data and constructional element position data for a plurality of elements, specifying positions of said predetermined constructional elements in the structure.

129. (New) The apparatus of claim 61, wherein said structure further includes connection data specifying connections between constructional elements in the structure.

130. (New) The apparatus of claim 61, wherein said represent comprises representing said structure to the user as substantially 2D elements located on a grid, said 2D elements representing said 3D constructional elements.

131. (New) The apparatus of claim 61, wherein said constructional elements comprise a plurality of sets of elements, each set having corresponding interfaces, the instructions further comprising:

input set selection data for selecting a set of said elements; and

store said set selection data on the storage medium in association with said structure data;

whereby data is provided specifying the construction of one of a set of said virtual 3D environments from the selected set of constructional elements.

132. (New) The apparatus of claim 61, wherein said represent includes displaying an approximate difference between an estimated memory requirement of the 3D virtual environment and a maximum available memory space.

133. (New) A data structure as claimed in claim 83, further comprising connection data for each element, for determining whether the at least one interface connects to another element.

134. (New) A data structure as claimed in claim 83, wherein said predetermined constructional elements comprise a plurality of sets of elements, each set having corresponding interfaces, the data structure further comprising set data specifying a said set of elements for use in constructing the virtual 3D environment.

135. (New) A data structure as claimed in claim 83, further comprising object placement data for use in determining the placement of objects within the virtual 3D environment.

136. (New) A data structure as claimed in claim 83, wherein said lighting data includes lighting phase data for setting a phase of a light intensity variation in the virtual 3D environment.